



清华大学
Tsinghua University



XIII Collaboration Meeting of the MPD Experiment at the NICA Facility

The progress of ECal production in China

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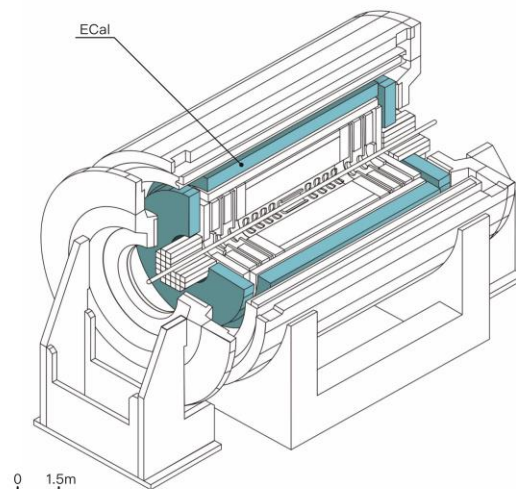
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Summary

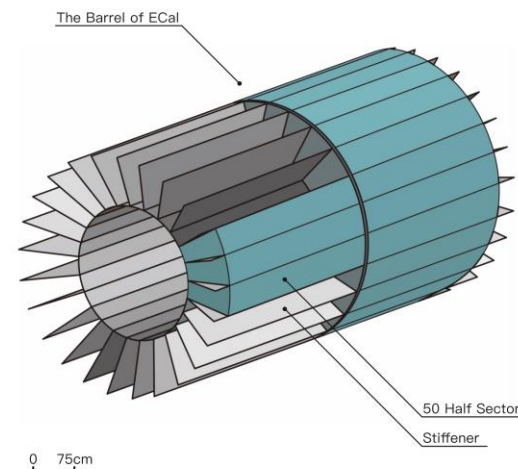
MPD-ECal production

MPD-ECal requirements:

- particle occupancy : $< 5\%$
- Time resolution : $< 1\text{ns}$
- Energy resolution : $< 5\%$
- @ 1GeV
- Operate in the magnetic FIELD : $\sim 0.5\text{T}$
- Adequate space resolution.

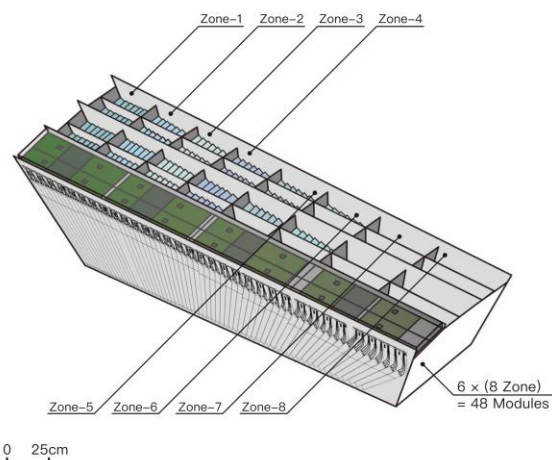


MPD-ECal

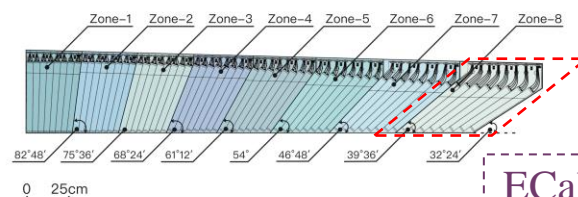


The Barrel of ECAL

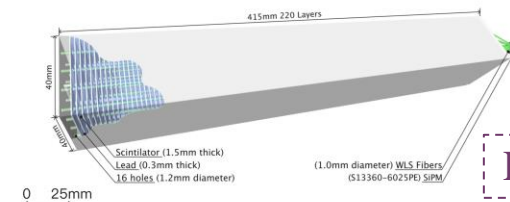
ECAL Half-Sector



ECAL 8-Zone



ECAL Module



ECAL Tower

The ECAL-MPD

1 Barrel

50 Half-sector

300 8-Zone module

2400 Module

38400 Tower

➤ **ECal module:**

Construction of 8 sectors. 768 modules in total.

Institutes: Tsinghua University 60%

Shandong University 20%

Fudan University 10%

University of South China 10%

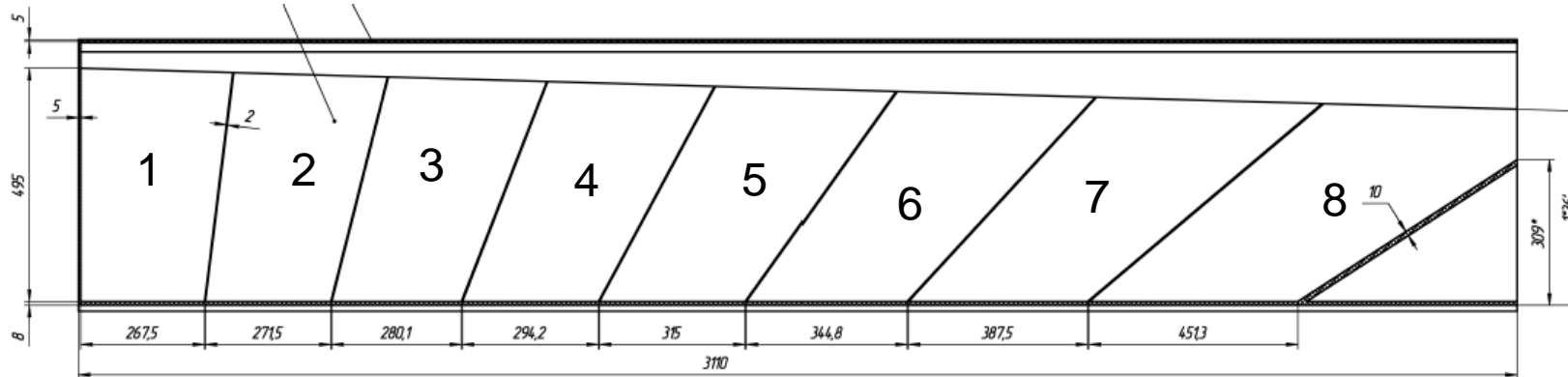
➤ **ECal PCB:**

Production and 1200 PCBs (without SiPMs).

Modules production in China

In the first stage, 8 sectors have been produced in China

8 sectors = 16 half sectors = 768 modules = 12288 towers



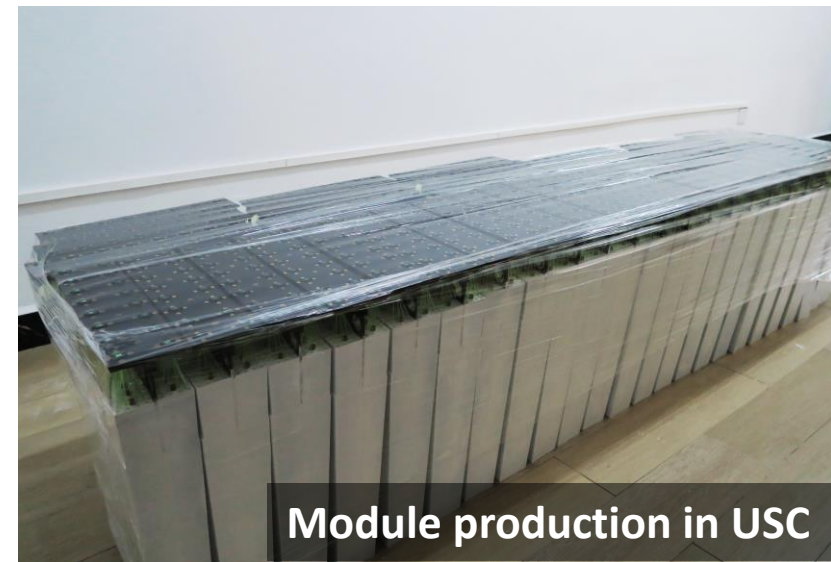
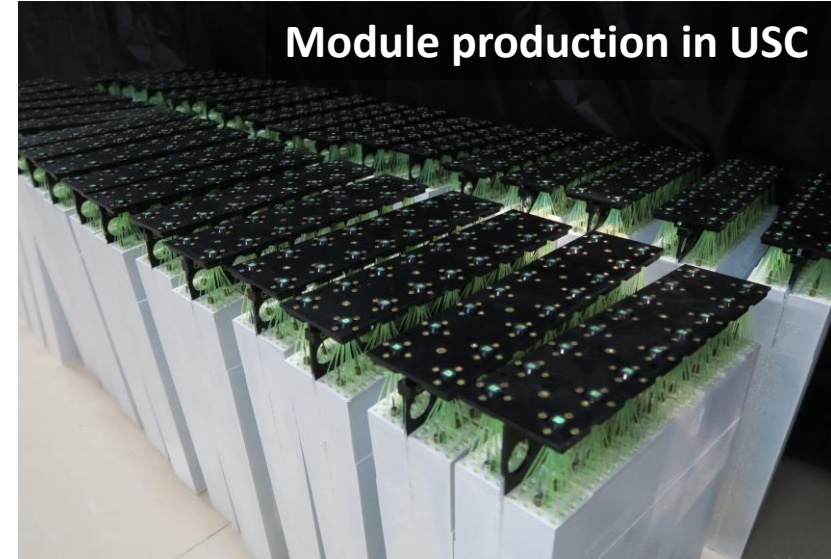
Modules produced in each institutes

	1	2	3	4	5	6	7	8	Total	Progress
THU	19	19		38	96	96	96	96	460	Finished
SDU			96	58					154	Finished
FDU		77							77	Finished
USC	77								77	Finished

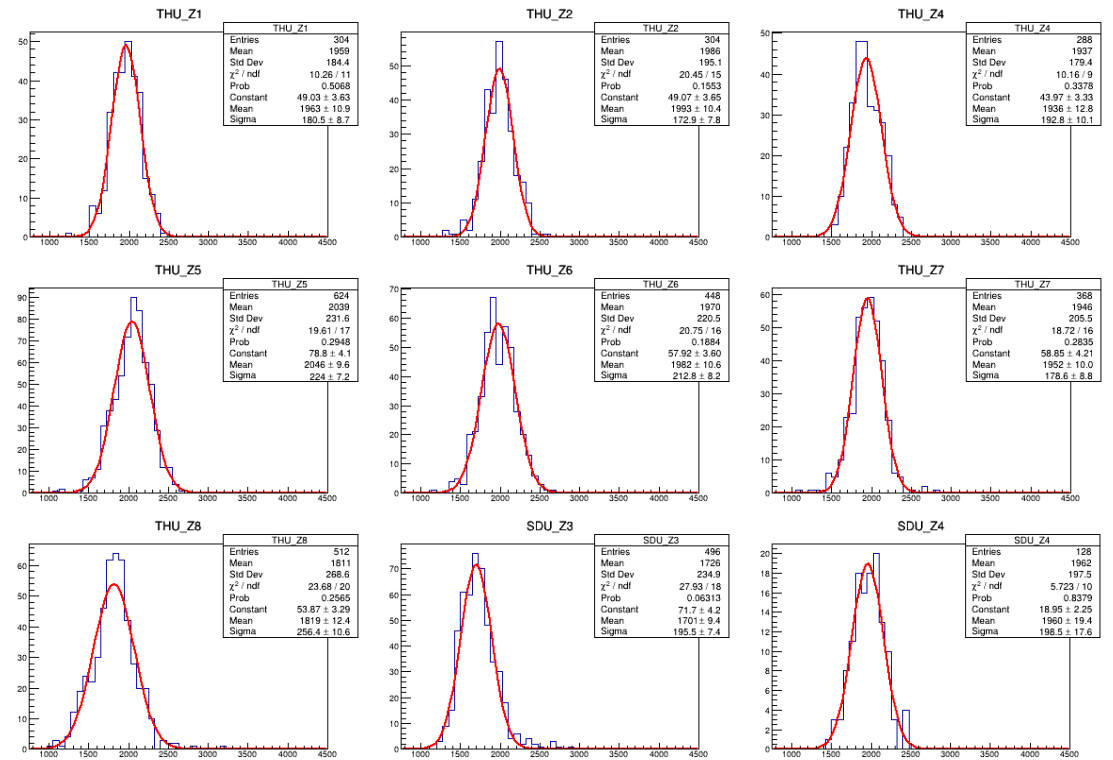
Modules production in China



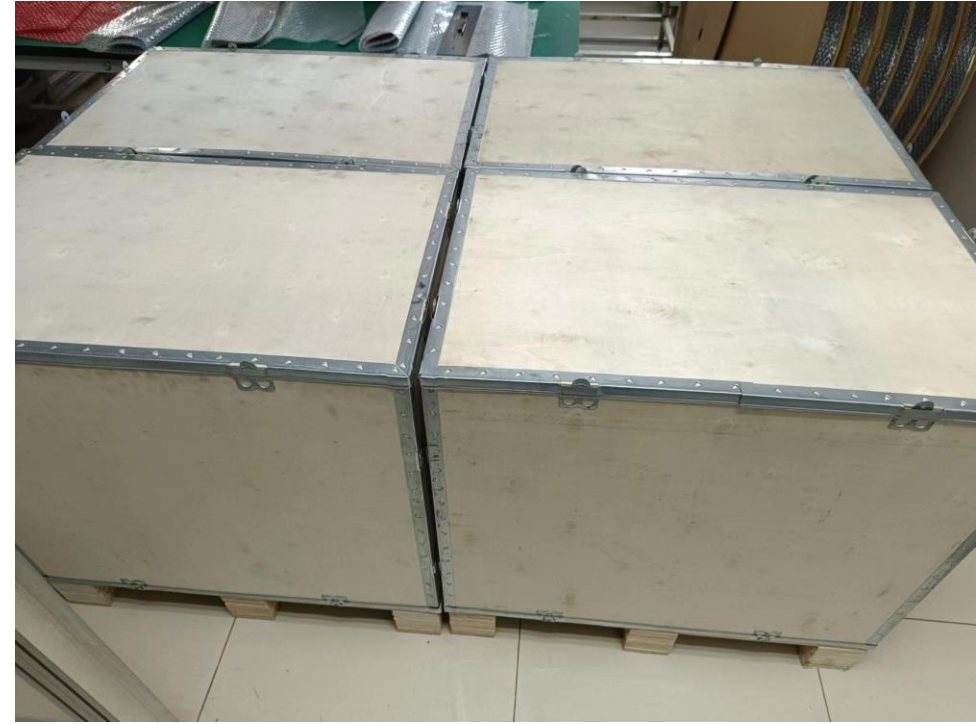
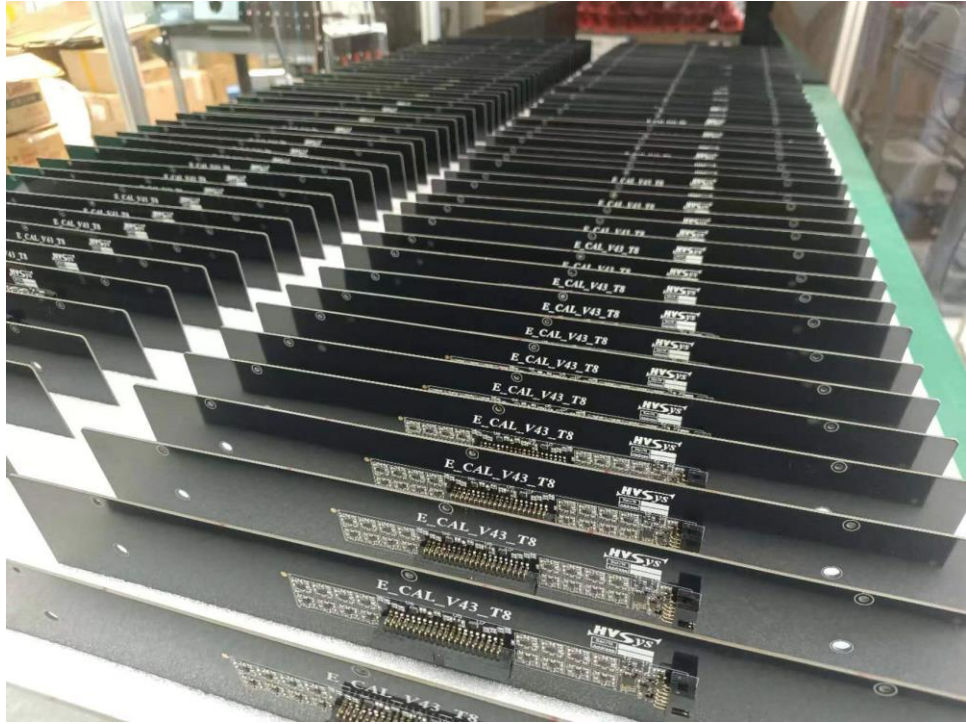
Modules production in China



➤ Cosmic test in JINR



PCBs production in China

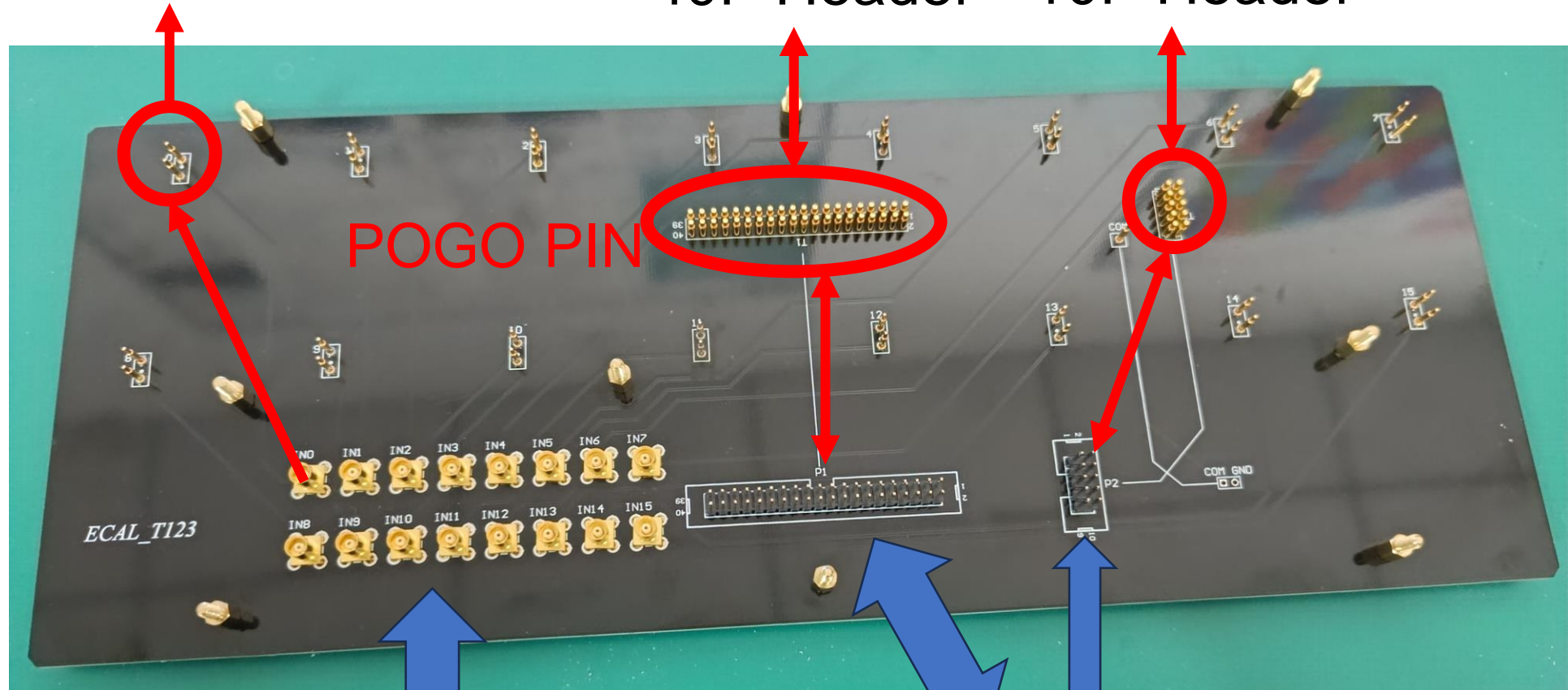


	T123	T4	T5	T6	T7	T8	Total	Production	Test	Shipment
THU	450	150	150	150	150	150	1200	Finished	Finished	Finished

The pads for SiPM

40P Header

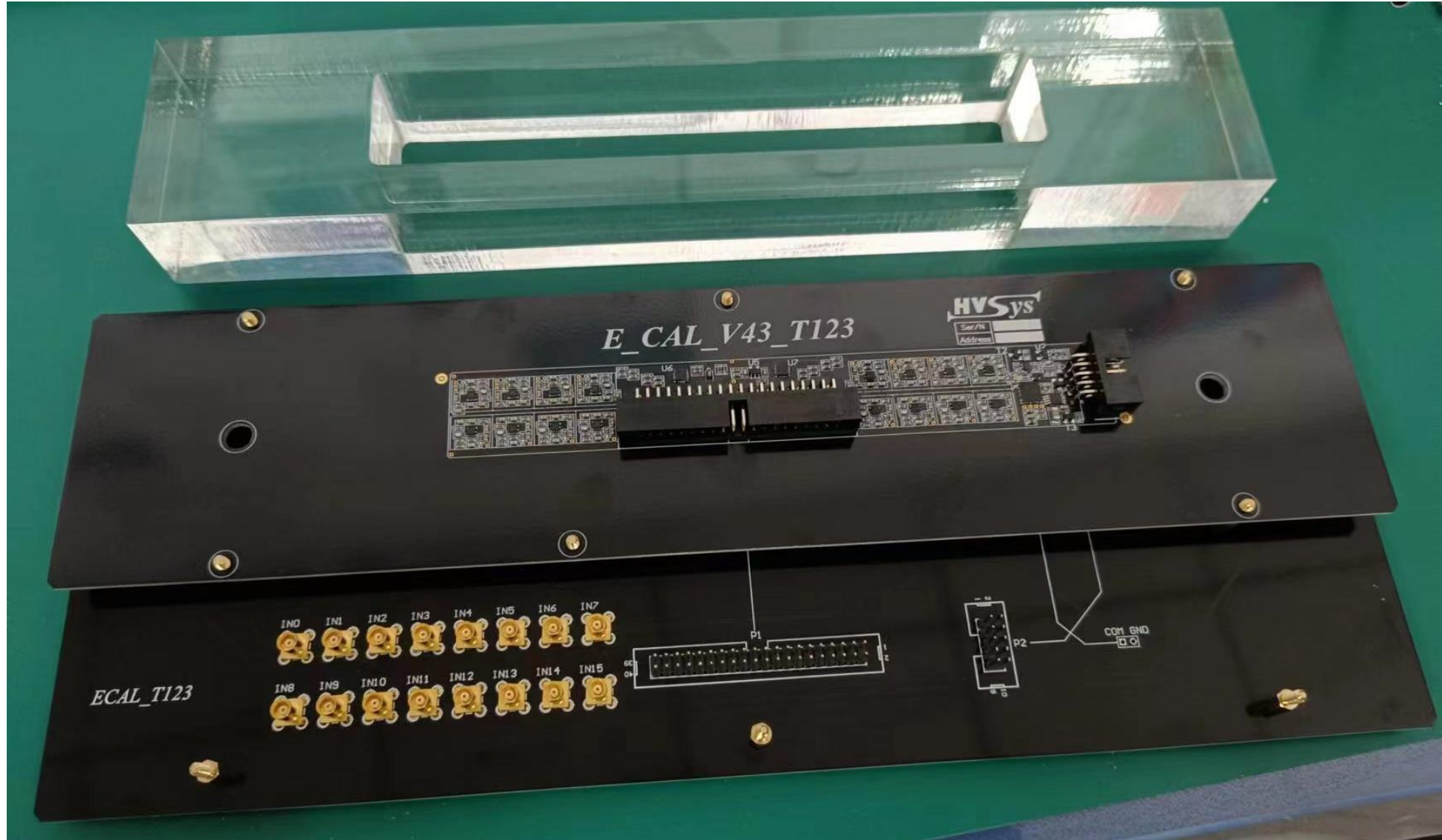
10P Header



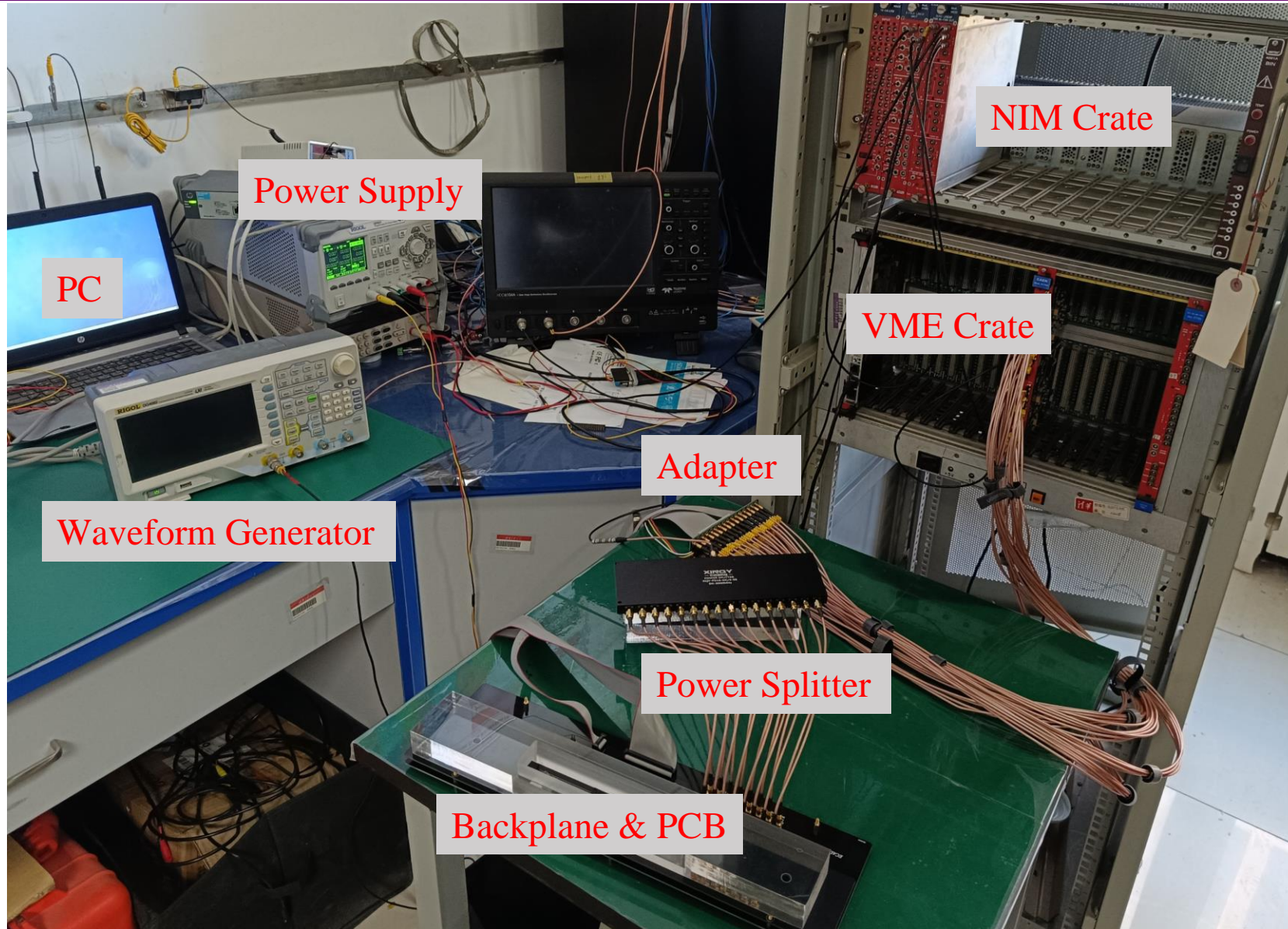
Input Signal

Adaptor

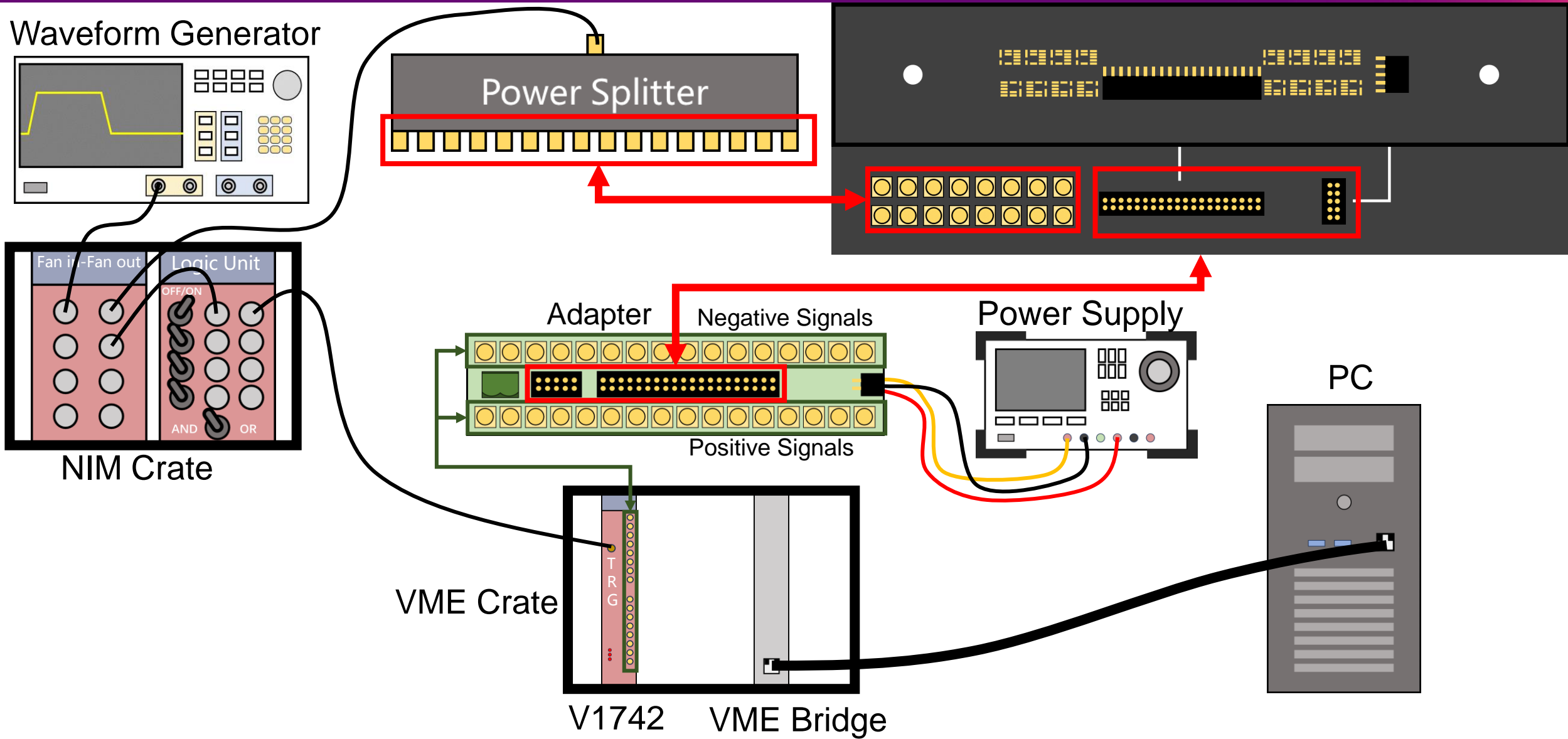
Batch test of ECal PCBs



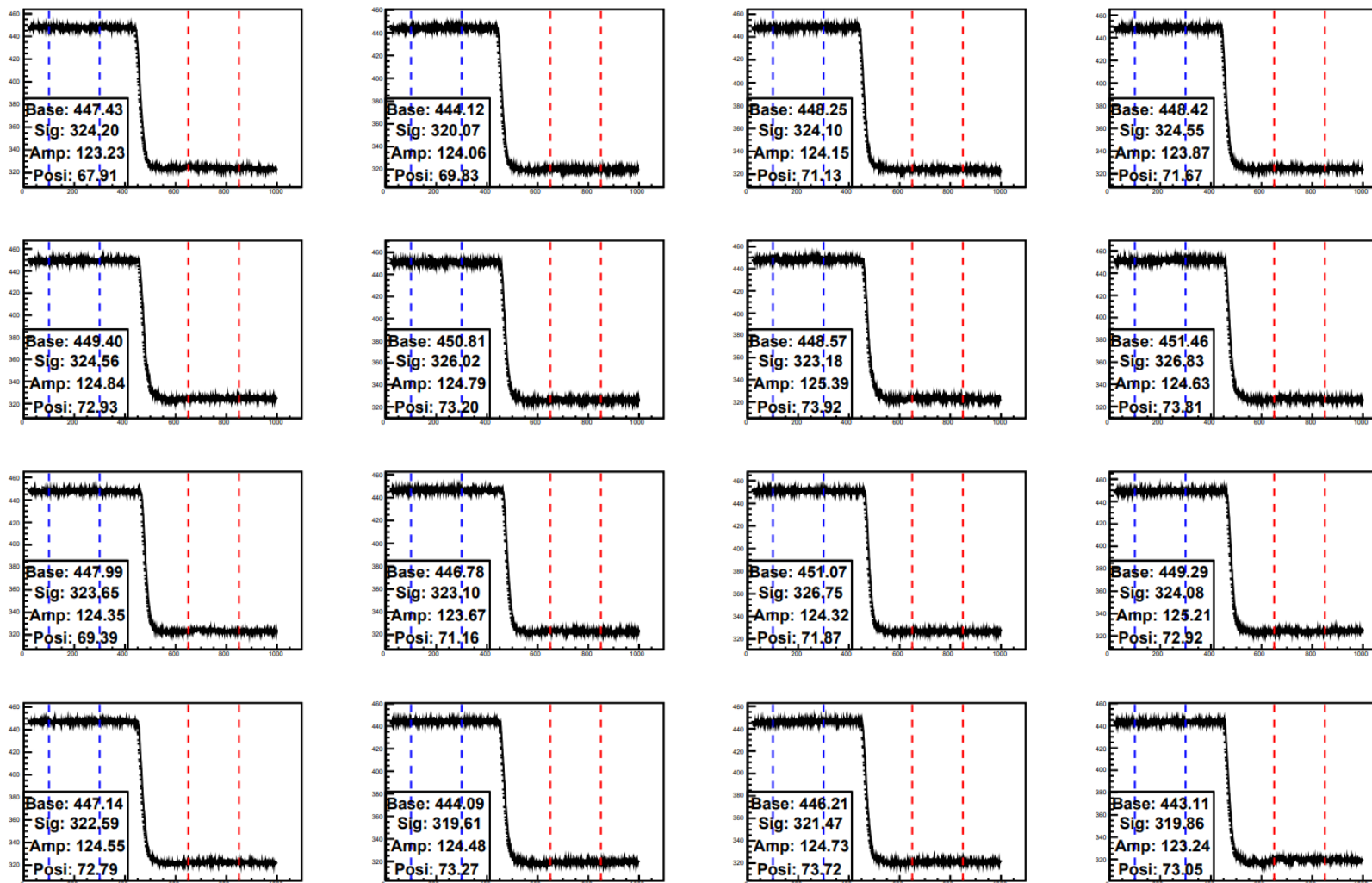
Batch test of ECal PCBs



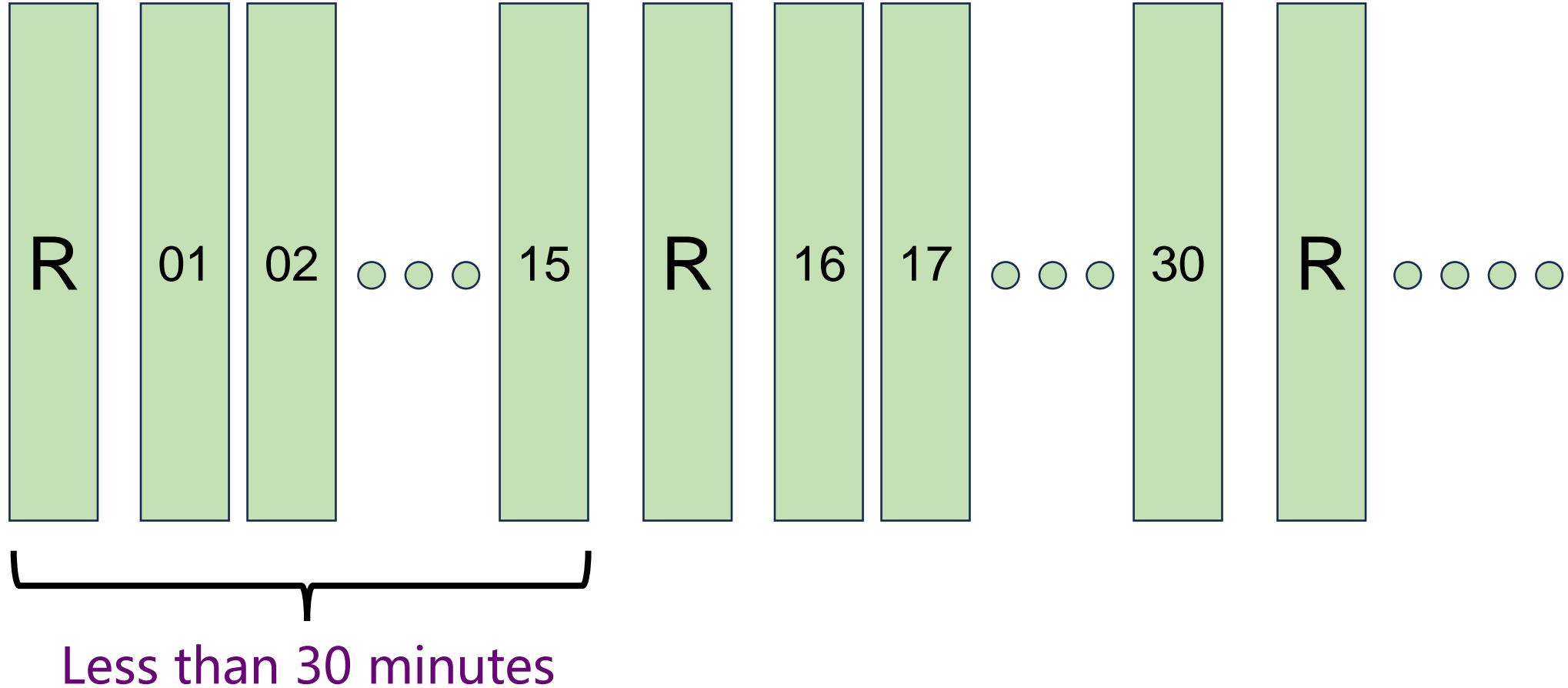
Batch test of ECal PCBs



➤ Example of waveforms of 16 channels

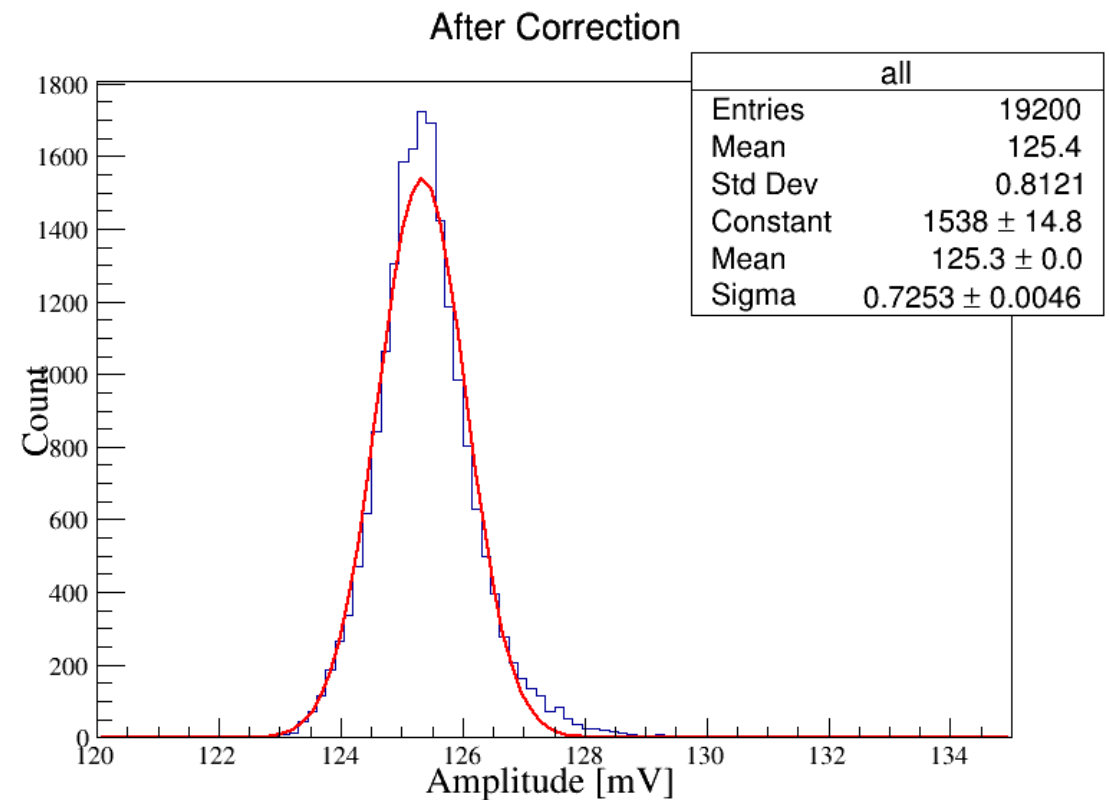
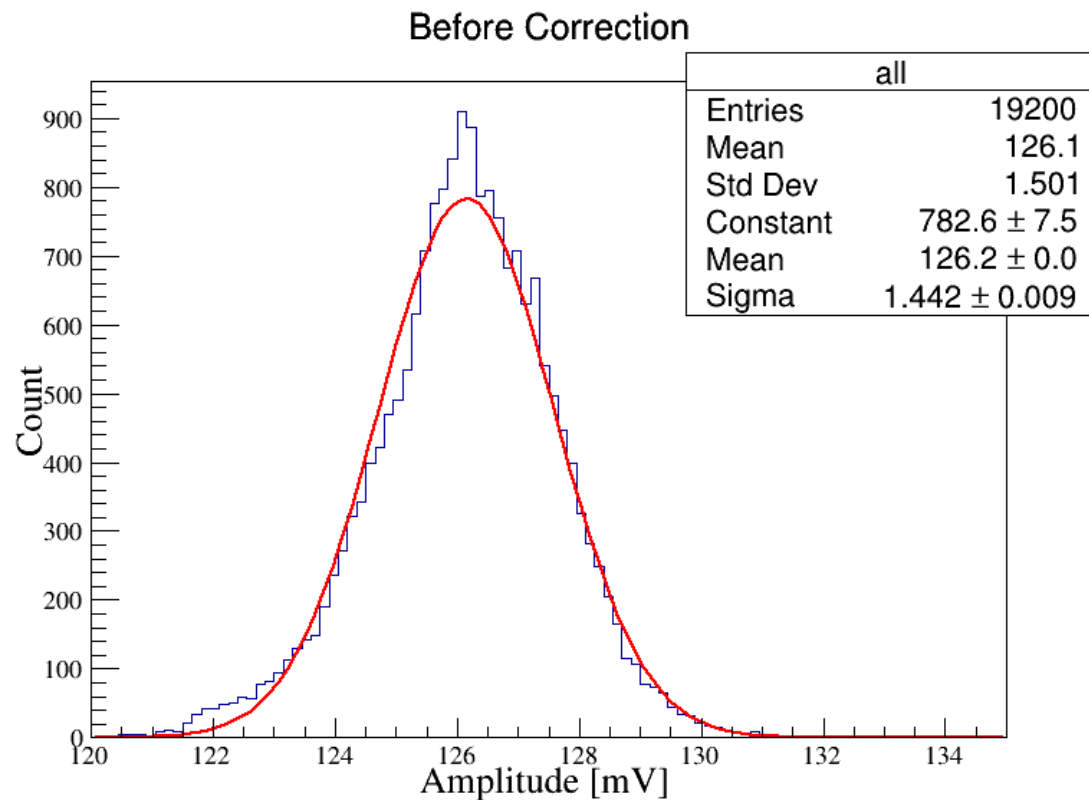


- The response of PCBs is related to the temperature slightly



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1200 boards, 19200 channels



- ✓ The China Group has established a **complete QA & QC system**. QA & QC of Material, Tower and Module have **reached the requirements**.
- ✓ **768 modules** have been shipped to JINR.
- ✓ The cosmic test results show that the light yield of different tower is **very consistent**.
- ✓ **1200 PCBs** have been produced in China and shipped to JINR.
- ✓ Each PCB has been tested before the shipment.